



GREEN PAPER

WATER ALLOCATION PLAN FRAMEWORK: CHALLENGES FOR IMPLEMENTATION

USAID GOVERNING FOR GROWTH (G4G) IN GEORGIA

4 MARCH 2016

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CONTRACT NUMBER: AID-114-C-14-00007

DELOITTE CONSULTING LLP

USAID | GEORGIA

USAID CONTRACTING OFFICER'S

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WATER RESOURCES MANAGEMENT IMPROVEMENT: 3600

LANGUAGE: ENGLISH

4 MARCH 2016

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DATA

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Project Component: Water Resource Management Component

Practice Area: Water Allocation Planning

Key Words: Water Allocation, Water Management

ACRONYMS

AA	Association Agreement
ADB	Asian Development Bank
BDD	Basic Data and Direction
EF	Environmental Flow
EIA	Environmental Impact Assessment
EOI	Expression of Interest
EU	European Union
FIU	Florida International University
G4G	Governing for Growth in Georgia
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GEL	Georgian Lari
Geostat	National Statistics Office of Georgia
GIS	Geographic Information Systems
GIWP	General Institute for Water and Hydropower Planning and Design
GLOWS	Global Water for Sustainability Program
GNERC	Georgian National Energy and Water Supply Regulatory Commission
GoG	Government of Georgia
GWh	Gigawatt Hours
GWP	Georgian Water and Power
HPP	Hydro Power Plant
INRMW	Integrated Natural Resources Management in Watersheds of Georgia Program
kWh	Kilowatt Hour
MENRP	Ministry of Environment and Natural Resources Protection of Georgia
MoA	Ministry of Agriculture of Georgia
MoESD	Ministry of Economy and Sustainable Development of Georgia
MW	Megawatt
NEA	National Environmental Agency
NEAP	National Environmental Action Programme
NGO	Non-Governmental Organization
O/M	Operation and Management
OECD	Organization of Economic Cooperation and Development
PPD	Public Private Dialogue
REC Caucasus	Regional Environmental Center for the Caucasus
UNDP	United Nations Development Programme
UNESCO	United Nations Education, Scientific and Cultural Organization
USAID	United States Agency for International Development
UWSCG	United Water Supply Company of Georgia
WFD	Water Framework Directive
WWF	World Wide Fund for Nature

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EXECUTIVE SUMMARY

Water allocation and water sharing is a key aspect of water resources planning and management. It involves planning how surface and underground water resources will be managed and shared to achieve environmental, economic and social outcomes.

This report is a review of existing Georgian legal, regulatory, policy and institutional frameworks within the context of basin water allocation planning as well as a gap analysis towards implementation of this approach. The report serves to trigger a broader dialogue among decision-makers and other stakeholders on the concept and importance of basin water allocation planning as well as on key barriers towards its implementation in Georgia.

A series of case studies conducted by United States Agency for International Development's (USAID's) project "Governing for Growth (G4G) in Georgia" revealed cases of water usage conflict and an urgent need for cooperation between ministries. Moreover, the expansion of hydropower plants, irrigated land and villages connected to potable water systems is expected to increase significantly over the next 6 to 10 years, further stressing the regions where scarcity of water exists and where water will become scarce with infrastructure expansion. The analysis contained in the report has showed that there is no enabling environment for applying modern basin allocation approaches in Georgia. The environmental considerations in water usage allocation are also neglected due to the absence of methodological and legal basis as well as knowledge on environmental flow assessments. The ongoing legal reform in water resources management will address many challenges if the Water Resource Management is enacted and effectively implemented.

1 INTRODUCTION

G4G is a five-year USAID funded project that is implemented by Deloitte Consulting LLP since 2014. G4G is designed to enhance governance in selected business enabling areas. Water resource management is one of the main components of the project. The Georgian government still faces challenges and problems related to sound water resource governance to be in line with European Union (EU)-Georgia Association Agreement (AA).

To support the Georgian government in initiated and planned legal and regulatory reforms within water resource governance, to ensure fair and transparent implementation and to provide a level playing field for small and medium size enterprise growth, G4G awarded a grant to Non-Governmental Organization (NGO) Regional Environmental Center for the Caucasus (REC Caucasus) to develop a Green Paper on Water Allocation Plan Framework – Challenges for Implementation. It is assumed that the Green Paper will introduce key elements of the water allocation process and propose a water allocation plan framework applicable for Georgia.

The report is a review of existing Georgian legal, regulatory, policy and institutional frameworks within the context of basin water allocation planning as well as a gap analysis towards implementation of this approach. The report is based on two guiding documents on water allocation planning that contain an overall framework for basin water allocation planning as well as case studies of developed European countries. The first is an Organization for Economic Cooperation and Development (OECD) publication, *Water Resource Allocation – Sharing Risks and Opportunities*¹, and the second - World Wide Fund for Nature (WWF), General Institute for Water and Hydropower Planning and Design (GIWP), United Nations Education, Scientific and Cultural Organization (UNESCO) and the Asian Development Bank (ADB) joint publication, *Principles, Procedures and Approaches for Basin Allocation Planning*².

G4G organized three Public-Private Dialogues (PPDs) in Tbilisi, Dusheti and Mtskheta with stakeholders to discuss major findings and recommendations of the report. The Green Paper report results were shared with private sector representatives, Government of Georgia (GoG) representatives and public. Comments received from PPD meetings were incorporated to the final Green Paper document, which was updated and finalized as per recommendations and suggestions received from PPD event stakeholders.

¹ http://www.keepeek.com/Digital-Asset-Management/oecd/environment/water-resources-allocation_9789264229631-en#page1

² <http://unesdoc.unesco.org/images/0022/002208/220875e.pdf>

2 SPECIFIC LEGAL PROVISIONS OF MEDIA-SPECIFIC LAWS REGULATING WATER QUANTITY

2.1 CLASSIFICATION OF GEORGIAN WATERS³

Water resources of Georgia are divided into surface and ground waters and altogether they form a state water fund. The land occupied by water bodies (except for the groundwater), along with hydraulic and other water management facilities, also the land designated as a water protection zone and sanitary protection zone are considered land of the state water fund. The land of the state water fund can be used for construction and operation of facilities necessary for meeting the needs for drinking, bathing, recreation and medical purposes as well as for agricultural, industrial, fisheries, energy, transportation and other purposes. The Georgian legislation sets special rules for the use of the land of the state water fund.

According to their hydrographic characteristics, geographic location, scientific, aesthetic, economic and environmental importance, the water bodies are classified in the following groups:

- Of special state importance;
- Of state importance;
- Of local importance.

The list of surface water bodies of special state importance and state importance is approved by the order of the Minister of Environment and Natural Resources Protection (MENRP) (Order # 61 of 07.05.1998 on approving the list of surface water bodies of special state importance and state importance).

2.1.1 DIFFERENT TYPES OF WATER USES⁴

The Georgian legislation sets different water use regimes for various categories (The Law on Water of Georgia, Article 9) prescribing that water bodies of state priority importance can be used only for scientific research, water protection, defense of state borders, firefighting, and disaster prevention and mitigation. Some economic activities related to the use of water and other natural resources are prohibited in water bodies of state priority importance.

The Law on Water distinguishes various types of water use: water abstraction, diversion, creation of artificial lakes, change of water level or direction of the flow, wastewater discharges, building and operations of hydro-engineering facilities (having impact on water quality and quantity) and groundwater surveys.

In general, there are two types of water uses: General Water Use and Special Water Use. Water use for non-commercial purposes (scientific-research, state geological surveys, scientific studies, environmental monitoring, control of groundwater quality and quantity, etc.), personal (drinking and bathing), aesthetic, recreational or sanitary-medical purposes without making use of special equipment or devices that have an impact on the characteristics of the water is considered as General Water Use. Groundwater use for the listed purposes with application of wells, filtrates, or simple drainage systems for springs is also considered General Water Use. Such uses should be registered by the state.

Water uses with the application of facilities or technical devices that have an impact on water condition are considered as Special Water Uses. In rare cases, water uses without application of special devices may be treated as Special Water Uses if they have an impact on water conditions. Special water uses serve the following purposes: Drinking, bathing, recreation, research, industrial, agriculture, hydropower and other hydro-technical purposes, fisheries, hunting, navigation, rafting of logs, construction of various communications, pipelines and other facilities, water extraction or diversion, creation of reservoirs and change in water level or flow direction. Currently, both types of water uses are free of charge.

³ Source: GLOWS-FIU. 2011. Technical Report 1: Rapid Assessment of the Institutional Policy and Regulatory Framework for Natural Resources Management in the Republic of Georgia. Global Water Sustainability Program, Florida International University. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report_1-Rapid-National-Assesment-of-Legal-Policy-and-Institutional-Settings-508-compliant_DONE1.pdf

⁴ Source: GLOWS-FIU. 2011. Technical Report 1: Rapid Assessment of the Institutional Policy and Regulatory Framework for Natural Resources Management in the Republic of Georgia. Global Water Sustainability Program, Florida International University. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report_1-Rapid-National-Assesment-of-Legal-Policy-and-Institutional-Settings-508-compliant_DONE1.pdf

Initially, the Law on Water (1997) required water use permitting and licensing for Special Water Uses. The licensees were charged against discharges of effluents into water bodies and water abstractions. Later, water use permitting was abolished in order to create, as argued, a favorable legal ground for economic development. Instead, the environmental impact permit was introduced by a new law on Environmental Impact Permits in 2007, which replaced the Law on Environmental Permits (1996). The law does not require a separate permit for water use. It integrates issues related to surface water abstraction and wastewater discharges in one environmental impact permit. Economic activities, not listed in the law on Environmental Impact Permit, are regulated by the Environmental Technical regulation issued in 2008 by the order # 745 of the MENRP.

Groundwater abstraction licenses are also issued by the MENRP through the National Environmental Agency (NEA). It is prohibited to transfer ownership of the license unless there is a legal basis and documentation for this. It is allowed to issue a license for multipurpose uses, e.g. for exploration and abstraction. If the licensee has a license on exploration of deposits, he/she will be given priority. The term of the validity of the license issued for abstraction of ground waters is up to 25 years and for exploration – up to 5 years. The license can be cancelled if the licensee violates the terms and the conditions of the licence. Licences are issued based on auction; The fee is one-time and consists of auctioning and resource use fees.

2.1.2 WATER USE INVENTORIES/ACCOUNTING, STATE CADASTERS AND BALANCES⁵

According to the existing Law on Water, the MENRP is obliged to establish the state system of water use accounting in order to create a knowledge base on Georgian water bodies. Moreover, the aim of the state system of water use is to ensure scientifically justified water allocation among various water users with a priority given to water use for drinking and bathing purposes, and to the protection of water bodies. State accounting of water resources is conducted via application of special water use registration forms approved by the National Statistics Office (Geostat). The forms are filled out on the basis of initial statistical accounts that should be kept by all special water users. The water-use initial reporting forms and their maintenance procedures are approved by the MENRP under the Order “On the Approval of Water-Use Initial Reporting Forms and their Maintenance Procedure.” Special water users are liable to furnish on a regular basis any water use-related information free of charge to the MENRP in accordance with instructions developed by the MENRP in coordination with the Geostat. This information should be entered into the unified environmental information system established within the MENRP.

Any use of ground waters, including geological survey, construction and Operation and Management (O/M) of underground facilities, etc., is subject to state accounting of water use and registration according to the law on “Mineral Resources.”

In accordance with the Law on Water, State Water Cadaster is to be created with data on water quantity, quality and water uses. Rules for water inventory and cadaster are defined by the MENRP through a specific regulation. The State Water Cadaster should be funded from the state budget. Furthermore, by the Law on Water, Surface Water Balances (budgets) should be calculated for individual river basins and territorial-administrative units and include assessments of water quality and quantity, available water resources, water supply, demand and structure of water uses. Creation and updating of Ground Water Balances as well as assessment and approval of water reserves are regulated by the law on “Mineral Resources.”

According to the Law on Water, water use and protection schemes/plans are to be created at national, river basin and administrative unit levels. These plans should meet the needs for drinking and bathing water supply, should regulate the water flow, and ensure efficient water use, effective water treatment or water pollution prevention. These integrated plans should be developed by scientific-research institutions through cooperation with various line Ministries and agencies and should be approved by the MENRP. Rules for Development of multi-purpose plans should be elaborated and approved jointly by the MENRP and Ministry of Economy and Sustainable Development (MoESD).

The Law on Water obliges the state to establish and maintain the unified system of water monitoring and information analysis. Its objectives are to collect and analyze data on water quality and quantity, assess energy potential of water resources, forecast and analyze natural disasters risks. Water monitoring is an integral part of

⁵ Source: GLOWS-FIU. 2011. Technical Report 1: Rapid Assessment of the Institutional Policy and Regulatory Framework for Natural Resources Management in the Republic of Georgia. Global Water Sustainability Program, Florida International University. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report_1-Rapid_National-Assesemnet-of-Legal-Policy-and-Institutional-Settings-508-compliant_DONE1.pdf

the state environmental monitoring system and is implemented by the MENRP.

Compliance assurance monitoring and control of water uses and protection is conducted by the MENRP through State Department of Environmental Supervision. For violation of the law on water and related regulations physical or legal persons may bear criminal or administrative charges according to the relevant Georgian legislation.

2.1.3 ONGOING LEGAL REFORM

The legal regime defined by the law on Water in effect will be soon superseded by the new law on Water Resources Management. This statutory act has already undergone all necessary procedures and is ready for submission to the Parliament.

The new law on Water Resources Management is based on the EU Water Framework Directive (WFD) and thus, takes into consideration integrated water resources management within the river basin context.

The new law on Water Resources Management considers re-introduction of water use regulations. Namely, according to the new law, special water user will be obliged to obtain a permit on surface water abstractions (in case abstraction is above 20m³ a day). The permit can be for single- or multi-purpose use. The latter is issued if the permit seeker is planning to make wastewater discharges into water bodies in addition to water abstractions. If the special water use is implemented in the context of an activity subject to Environmental Impact Assessment (EIA) and environmental permitting then there is no need to apply for a separate water use permit which is already embedded in integrated environmental permit.

The validity term of the permit is 5 years, but for certain water uses it is different. Namely, for irrigation water use the permit is issued for 10 years, for Hydro Power Plants (HPPs) with 2 MW or larger capacity – for up to 30 years, for HPPs with up to 2 MW capacities – for 10 years and for drinking water consumption – up to 25 years.

The permittee is obliged to keep a record of water uses, install and operate water meters and hydrometric equipment at water intakes and report periodically to the MENRP on actual water uses. Under force majeure situations, the entitlements of the permittee may be restricted.

The law sets a priority order for water allocations assigning the greatest importance to the water abstraction and use for drinking water supply thus, putting it in the first place of the raw for water allocations.

National water management strategy and river basin plans represent policy mechanisms for planning and managing water resources. The development of a national water strategy has to be coordinated by the inter-agency water commission and has to be approved by the government. The planning cycle for the strategy covers 15 years. The development of the river basin plans for river basin management districts that are to be defined by special sub-laws (regulations) has to be coordinated by the MENRP in consultation with river basin councils, basin district stakeholder advisory bodies established with the Ministry. The planning cycle for river basin management plans covers a 6-year period, as determined by the EU WFD.⁶

As part of the on-going legal reform, several regulations have been recently developed. The first one is a government decree on the identification and designation of river basin management districts, which divides the whole country into 6 districts for the purpose of river basin planning and management: i) Alazani-Iori river basin district; ii) Kura river basin district; iii) Khrami-Debel river basin district; iv) Rioni-Enguri river basin district; v) Kodori-Bziphi river basin management district, and; vi) Chorokhi-Adjaristskali river basin district. The second sub-law refers to the establishment of river basin district consultative councils to be composed of broad range of stakeholder with the MENRP. The third regulation is rules and procedures on development, consultation and approval of river basin plans.⁷

⁶ Source: Draft Law on Water Resources Management.

http://moe.gov.ge/files/PDF%20%20qartuli/qancxadebebi/2015/wylis_kanoni/Kanonproeqti_Wylis_Resursebis_Martvis_Sesakhebpdf

⁷ Source: Basin management consulting-coordination board composition and proceedings"; "On defining basin-territorial entities for integrated management of river basins"; On the approval of the provision on river basin management plans". http://moe.gov.ge/index.php?lang_id=GEO&sec_id=69&info_id=3960

2.2 SECTORAL LEGISLATION

2.2.1 AGRICULTURE SECTOR⁸

As discussed, currently agricultural water use is not subject to licensing. However, under the new law, it is planned to be regulated. Furthermore, new draft EIA law envisages putting the construction and operations of new irrigation systems in the list of activities/projects subject to EIA and environmental permitting.

In 2006, based on the Decree of the GoG, the Department of Amelioration System's ownership of the primary irrigation and drainage networks under the Ministry of Agriculture (MoA) was abolished and based on this, four Limited Liability State-Owned Companies (LLCs) were established. In addition, through a statutory act, irrigation and drainage associations were abolished by the end of 2011. In 2012, the "Georgian United Amelioration Systems Company" (the limited liability 100% state-owned company) was created under the management of MoA. The company now is responsible for operations and maintenance of the irrigation-drainage systems across the country.

In accordance with the Order of the Minister of Agriculture of January 27 2011, two categories for land reclamation/amelioration services were defined: Irrigation and drainage services. These services are provided by the primary water users (LLC companies) based on the fees set out by the GNERC. Irrigation and drainage tariffs are defined based on the Decree of the Georgian National Energy and Water Supply Regulatory Commission (GNERC) issued on February 1 2011, which is 75 GEL/hectare/annum (irrigation) for east Georgian systems and – 45 GEL/hectare/annum for west Georgian systems. For drainage it is 40 GEL/hectare/annum.

2.2.2 HYDROPOWER SECTOR⁹

The laws and regulations governing the power sector, including hydropower sector are:

- **The Law on Electricity and Natural Gas** - regulates the areas of electricity system operation, wholesale electricity (capacity) trade, electricity generation, transmission, dispatch, distribution, import, export and consumption as well as the areas of natural gas supply, import, export, transportation, distribution and consumption. It aims at promoting proper operations and development of electricity and natural gas sectors in Georgia, based on market economy principles. The Law also defines roles and responsibilities of all relevant players in electricity and gas sectors and sets-up regulatory (licensing) and market-based mechanisms (tariffs) requirements for the management of the sector;
- **Electricity (capacity) Market Rules issued by the Ministry of Energy and rules for Power Delivery and Consumption issued by the GNERC** - govern the relationships between power generating, dispatching, and transmitting companies, as well as between distribution companies and consumers including direct consumers in electricity sector;
- **Resolution of GoG # 214 Rule of Expression of Interest for Construction Technical and Economic Feasibility Study, Construction, Ownership and Operation of Power Plants in Georgia** - Ministry of Energy of Georgia sets the list of potential power plants and publishes the list on official web-page. The Expression of Interest (EOI) can be announced only for projects which are included in the list.

Decision regarding announcement of expression of interest for particular project, which is included in the list is taken by Government of Georgia. Such decision can be provoked by officially demonstrated interest by investor. After such decision is in place Ministry of Energy publishes the information about new announcement of EOI.

After every decision of Government of Georgia to announce expression of interest for particular project, Ministry of Energy will elaborate individual terms and conditions of EOI for every project. Thereafter, Ministry

⁸ Source: GLOWS-FIU. 2011. Technical Report 1: Rapid Assessment of the Institutional Policy and Regulatory Framework for Natural Resources Management in the Republic of Georgia. Global Water Sustainability Program, Florida International University. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report_1-Rapid_National-Assesemnet-of-Legal-Policy-and-Institutional-Settings-508-compliant_DONE1.pdf

⁹ Source: GLOWS-FIU. 2011. Technical Report 1: Rapid Assessment of the Institutional Policy and Regulatory Framework for Natural Resources Management in the Republic of Georgia. Global Water Sustainability Program, Florida International University. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report_1-Rapid_National-Assesemnet-of-Legal-Policy-and-Institutional-Settings-508-compliant_DONE1.pdf

will issue corresponding order and actually announce the EOI and publish the terms and conditions. The only criterion of winning in expression of interest is the lowest selling price of electricity in winter period to offer to “Electricity System Commercial Operator” (ESCO).

To participate in EOI interested parties should satisfy following qualification demands:

- 1. In expression of interests can participate legal entity or consortium of legal entities
- 2. During first 10 years of operation of the power plant(s), Winner of Expression of interest should sell 20% of annual generation of the power plant to ESCO, by predetermined guaranteed purchase agreement.

The winner of Expression of Interest will be announced by the resolution of Government of Georgia. Thereafter, memorandum of understanding is signed with the winner, sides of memorandum are Government of Georgia, ESCO and winner of Expression of Interest.

As for the regulation of water allocation to and uses by hydropower plants, currently water abstractions by existing HPPs are not subject to licensing, and charges. Though greenfield HPPs and major modifications with 2 MW or larger capacities are subject to EIA. By common practice (there is no specific regulation governing environmental flows), environmental flows are set at 10% of the multi-year annual average flows of the rivers.

2.2.3 POTABLE WATER SUPPLY SECTOR¹⁰

Currently, issues related to the abstraction and uses of potable water are regulated by the laws on Water and Mineral Resources as well as by a number of regulations, including:

- # 32 Resolution, 26.11.2008 of the GNERC on the “Approval of the Rules on Drinking Water supply and Consumption.”
- # 18 Resolution, 29.08.2008 of the GNERC on the “Approval of the Methodology on Setting Out Water Use Tariffs.”
- # 14 Resolution, 26.11.2008 of the GNERC on “Penalizing Illegal Users of Centralized Water Supply and Sanitation Systems.”
- # 17 Resolution, 17.08.2010 of the GNERC on “Water Supply Tariffs.”
- # 10 Decree, 30.01.2009 of the Government of Georgia on “Approval of the Charter of the Ministry of Regional Development and Infrastructure.”
- Regulations of the “United Water Supply Company of Georgia” LLC Approved by the Order No 02/01 dated 1st March 2010 of the director of “United Water Supply Company of Georgia.”

In accordance with the law on water, during the allocation of water resources, water allocation for drinking and bathing purposes is given first priority.

The law on Mineral Resources of Georgia requires licensing of ground water abstractions for drinking water supply (for more details see relevant parts on surface waters and mineral resources).

In 2007, amendments were made to the Law on Electricity and Natural Gas that mandated by GNERC to set-up water supply tariffs. Thus, the GNERC was transformed into the commission regulating water market in addition to energy market. It is now called as the Georgian National Energy and Water Supply Regulatory Commission. One of the major functions of the GNERC is elaboration and adoption of a methodology for regulation of water tariffs to ensure effective tariff reform in the cities and regions.

In August 2008, the GNERC adopted the methodology on water supply tariffs. In accordance with this regulation, the tariff calculation methodology is based on a full cost-recovery principle of drinking water supply and sewage treatment as well as on full cost-recovery of environmental expenditures incurred. In addition, it takes into account profitability of water supply companies. Water tariffs can be adjusted to inflation rates and base tariff rates for electricity and water use fees. The methodology defines water supply tariffs for individual companies. Tariffs reflect technical losses and norms for company consumption defined by the GNERC. More specifically, the tariff consists of water supply system capital, operational and maintenance costs and the reasonable profit, including future investment risks. However, it should also take into account the current social-

¹⁰ Source: i) GLOWS-FIU. 2011. Technical Report 1: Rapid Assessment of the Institutional Policy and Regulatory Framework for Natural Resources Management in the Republic of Georgia. Global Water Sustainability Program, Florida International University. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report-1-Rapid-National-Assesemnet-of-Legal-Policy-and-Institutional-Settings-508-compliant_DONE1.pdf; ii) Assessment of Water Supply System of the City of Telavi. #7 Technical Report. USAID/Glows Program Integrated Natural Resources Management in Watersheds of Georgia. GLOWS-FIU. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report-7-Telavi-Water-Supply-Systems-Assessment_DONE.pdf

economic conditions of the country and the affordability of consumers. Tariffs should be calculated by the companies themselves and submitted to the GNERC for approval. Costs should not include non-water supply related expenditures, excess losses, penalties, etc. Thus, Water supply tariffs should be calculated based on 1m³ water supplied to individual consumers. Water base tariff rates can vary for different categories of consumers and they are adopted by the GNERC. The Commission, given the current low metering rate, can set up water supply tariffs per capita. There are no separate tariffs for wastewater treatment.

Water tariffs vary considerably among major cities across the country. The tariff in Tbilisi is much lower than elsewhere, but this does not necessarily translate into a lower water bill for households, given that the latter is established on the basis of the water consumption norm (limit), which is much higher in Tbilisi as compared to that of other cities. In rural areas, water bills are either on a person per annum basis or household per annum basis.

The Organic Law on Local Self-Governance stipulates that water tariffs are set by local authorities, but there is no guidance for tariff-setting in terms of basic principles and objectives elaborated in the law. Traditionally, local governments have set what are considered to be uniform socially acceptable tariffs without regard for the financial implications for the water companies. To some extent, the affordability problem is now being addressed by the Government's new targeted social assistance program.

2.2.4 LOCAL SELF-GOVERNANCE¹¹

Organic Law on Local self-governance defines a legal regime for local self-governance. In accordance with this statutory act, local self-governing bodies (municipal authorities) are entitled to own local natural resources, including water resources of local importance as well as to issue entitlements for the use of local property through public or electronic auctioning, including natural resources. The law allows for a number of management arrangements for the use of local resources, including lease, concession, usufruct, etc.

Local self-governing bodies have the right to establish joint public works units through merging of various executive units to provide public services to their municipalities. In addition, they can establish non-commercial associations and/unions and join similar international self-governing associations and/or unions.

2.3 EXISTING POLICY AND PLANNING FRAMEWORK

2.3.1 NATIONAL SOCIAL-ECONOMIC DEVELOPMENT STRATEGY AND MID-TERM EXPENDITURE FRAMEWORK

The government strategy for social-economic development until 2020 considers the rehabilitation and construction of water supply and irrigation-drainage systems across the country as one of the top priorities. It also recognizes the importance of adopting integrated water resources management and river basin planning and management principles for sustainable and efficient uses of water resources and improved coordination among water users.¹²

Water infrastructure development objectives are further translated into the nation-wide document on budgetary priorities of the GoG Basic Data and Direction (BDD), a four-year program on that consists of medium-term macroeconomic and fiscal forecasts as well as key initiatives for the country's fiscal policy. The latest BDD covering the period from 2016-2019 echoes social-economic development strategy and considers rehabilitation and development of urban and rural water supply systems. In the area of environmental protection, the priorities among others include upgrading and further development of the environmental monitoring and forecast system as well as sustainable natural resources management, including water resources.¹³

2.3.2 EU-GEORGIA ASSOCIATION AGREEMENT

The AA between Georgia and the EU, along with other international environmental agreements, requires Georgia to approximate its legal-regulatory, political and institutional systems with those of the EU in almost all areas. Sustainable management of water resources and dealing with water scarcity are listed among top priorities under the environmental chapter of the Agreement under which the country is committed to adopt and implement the new law on Water Resources Management (AA; Article 306; Annex XXVI; Environment; Water Quality and

¹¹ Source: Organic Law. The Code on Local Self-Governance. <http://static.mrdi.gov.ge/5326b29e0cf287919443293a.pdf>

¹² Source: Social-economic Development Strategy of Georgia – Georgia 2020, Government of Georgia <http://static.mrdi.gov.ge/551018320cf24147438b16fd.pdf>

¹³ Source: The main data and directions of the country for 2016-2019 (initial draft). Government of Georgia <http://www.mof.ge/en/4543>

Resource Management Including Marine Environment).¹⁴

2.3.3 SECTORAL STRATEGIES

2.3.3.1 NATIONAL ENVIRONMENTAL ACTION PROGRAM

The National Environmental Action Programme (NEAP) is a 5-year policy document, establishes short- to medium-term targets and priority environmental actions for the country. The latest NEAP covers the period from 2012 through 2016 and among others lists priorities in the area of water resources management. More specifically, for managing water quantity it sets establishment of an effective water management system that among others should be implemented through introduction of integrated river basin planning and management in pilot basins, development of a new law on water and relevant sub-laws. Moreover, under the natural disaster chapter, the NEAP aims at modernizing an early warning system through a number of activities, including improved hydro-meteorological observations and forecasts.¹⁵

2.3.3.2 NATIONAL WATER RESOURCES MANAGEMENT STRATEGY

At present there is no separate strategy for water sector. Once the new Water Resource Management is in effect and under implementation a document covering a 15-year time horizon and setting national-wide water management strategic goals and objectives should be produced by the state inter-agency commission.

2.3.3.3 REGIONAL DEVELOPMENT STRATEGY AND PROGRAM

The Regional Development Programme of Georgia - 2015-2017 sets 3-year regional development priorities for the country, including those for water infrastructure with a focus of rehabilitation of existing water supply systems and headworks in rural and urban areas, proper maintenance of existing systems and water consumption metering in the regions. The indicative average annual budget for planned activities that also include rehabilitation of sanitation systems is US \$113 million per year. The program also aims for rural development through a number of measures, including rehabilitation of existing irrigation systems and introduction of new efficient technologies (e. g. drip and sprinkle irrigation systems) in Kakheti, Mtskheta-Mtianeti, Shida Kartli and Kvemo Kartli regions. The indicative annual average budget for the set of activities is about US \$83 million.¹⁶

2.3.3.4 POWER SECTOR STRATEGY

The main strategic document in the power sector is "Main Directions of State Policy in Georgian Power Sector" that was approved by the # 3728-II resolution of Parliament of Georgia on 24 June 2015. In accordance with this document, utilization of other alternative sources of energy with a focus on local hydro resources is considered as one of the priority strategic directions for the country.¹⁷

2.3.3.5 AGRICULTURE DEVELOPMENT STRATEGY

In 2015 the MoA of Georgia adopted a Strategy for Agricultural Development in Georgia for 2015-2020. The strategy considers modernization of irrigation and drainage systems as one of the priority directions. More specifically, the actions under this direction include: i) Construction and rehabilitation of water reservoirs for irrigation purposes; ii) rehabilitation of irrigation infrastructure and specific headworks; iii) rehabilitation of drainage infrastructure and primary channels; iv) detailed studies of modern technologies and management approaches for efficient water use; v) improvement of hydrometric service; vi) support to rehabilitation of drip and sprinkle irrigation systems, and; vii) fair and optimal allocation of water resources and improvement of tariff system; ensuring involvement of water-user groups in the rehabilitation and maintenance of internal systems; promotion of farmer organizations and institutional arrangements.

Modernization of irrigation and drainage infrastructure will ultimately lead to the improvement of water

¹⁴ Source: 2015 National Action Plan for the Implementation of the Association Agreement between Georgia; The Association Agenda between Georgia and the European Union approved by the Decree №59 of the Government of Georgia 26 January 2015. http://www.eu-nato.gov.ge/sites/default/files/AA%20National%20Action%20Plan%202015%20-%20FINAL%20ENG_0.docx

¹⁵ Source: National Environmental Action Programme of Georgia 2012 –2016. Tbilisi 2012. http://www.preventionweb.net/files/32326_32326neapeng20121.pdf

¹⁶ Source: Regional Development Programme of Georgia. 2015-2017. Government of Georgia. <http://static.mrdi.gov.ge/550c24ee0cf24147438b16f6.pdf>

¹⁷ Main Directions of the State Policy in Energy Sector of Georgia. <http://www.energy.gov.ge/projects/pdf/pages/MAIN%20DIRECTIONS%20OF%20THE%20STATE%20POLICY%20IN%20ENERGY%20SECTOR%20OF%201047%20eng.pdf>

management, water removal from flooded areas, and increase in soil fertility and productivity. The rehabilitated irrigation and drainage infrastructure, as well as use of modern agricultural technology will ensure harvest of agricultural crops, ensuring involvement of water-user groups in the rehabilitation and maintenance of internal systems, and promotion of farmers.¹⁸

¹⁸ Source: Strategy for Agricultural Development in Georgia - 2015-2020. 2015. Ministry of Agriculture.
http://www.moa.gov.ge/fileman/Uploads/STRATEGIA_ENG_print.pdf

3 KEY BARRIERS TO BASIN WATER ALLOCATION PLANNING

3.1 LEGAL-REGULATORY AND POLICY BARRIERS TO THE IMPLEMENTATION OF WATER ALLOCATION PLANS

Generally speaking, current legal-regulatory setting in water resources management does not support the basin water allocation planning. Although the Law on Water sets requirements on the development of water balances (water budgets) for individual river basins, these are only general provisions. Steps, rules, procedures and methodologies for the development of such plans are not further elaborated in the form of sub-laws or guidance documents. An institutional mechanism for water use planning contained in the current law is vague and does not take into consideration participation in the river basin planning process by stakeholders (e.g. local branches of all line Ministries involved in water-related activities as well as local municipalities). The law also mandates scientific institutions to develop water allocation schemes/master plans but does not specify which organizations should undertake these mandates. The financial mechanism for the planning process is clear, however, the requirements for water use schemes/plans are not implemented in practice.

Even within the ongoing legal reform, basin allocation planning is overlooked. The concept of river basin plans in the new law is based on EU requirements and is more concerned with water quality rather than with water quantity (including water allocations). The explanatory note to the draft law refers to setting of quotas on total surface and ground water abstractions within the framework of river basin plans. However, the law itself does not contain such provisions. Therefore, further elaboration of such requirements is needed in the sub-laws.

Within the current legal setting surface water abstractions are not subject to water use licensing and charges, though they should agree on abstraction volumes with the MENRP and annually report actual withdrawals and consumptions. Moreover, environmental impact permitting legislation leaves many water related activities out of its scope, including construction/significant modification (e.g. increase in headwork's capacity) of potable water or irrigation systems, inter-basin transfers, etc. Most importantly, activities subject to EIA can be waived from this requirement if the activity is of high state importance. The status of the activity to fall under this category is defined by the MENRP on the basis of recommendations from the expert advisory council. However, there is no common definition what is meant by "special state importance." In this regard, any activity subject to EIA can be waived and there is a danger that influential Ministries and lobbyists will have an impact on the decision of the MENRP.¹⁹

Some of the drawbacks in EIA, environmental impact and water use permitting/licensing will be addressed by the draft laws on EIA and Water Resource Management, by expanding the list of water use-related activities/projects subject to EIA, environmental impact permitting (e.g. new irrigation schemes, inter-basin transfers) and introducing water use permits for abstractions.

As for the nation-wide water policy and river basin plans, there is no such policy document in the country. River basin plans exist only at the pilot level (e.g. Chorokhi-Adjaristskali river basin). With enactment of the new law on Water Resource Management, the development of the 15-year Water Resources Management Strategy as well as river basin plans for 6 basin management districts will be mandatory.

3.2 INSTITUTIONAL CAPACITY BARRIERS TO THE IMPLEMENTATION OF WATER ALLOCATION PLANS

At present, the organizational setting of the state system for freshwater management is extremely centralized within the MENRP.

Cross-sector and inter-agency cooperation in the area of water resources management usually occurs only during development of laws, EIAs and environmental impact permitting. With the enactment of the new

¹⁹ Source: GLOWS-FIU. 2011. Technical Report 1: Rapid Assessment of the Institutional Policy and Regulatory Framework for Natural Resources Management in the Republic of Georgia. Global Water Sustainability Program, Florida International University. http://www.globalwaters.net/wp-content/uploads/2014/03/Technical-Report-1-Rapid-National-Assesment-of-Legal-Policy-and-Institutional-Settings-508-compliant_DONE1.pdf

Water Resource Management law it will be mandatory to establish an inter-agency commission for the purpose of the developing long-term water policy. Although, the law requires development of a regulation on the scope of work and mandate of the commission it does not say anything about the procedures, scope and methodology for the development of a national water policy itself. Nor does it require development of specific regulation on the policy. In an ideal case, water policy may serve as nation-wide water allocation plan or at least should contain basic principles and objectives for regional water shares and as well as socio-economic and environmental assessments of water resources within the basin districts.

NEA is responsible for developing water resources cadasters, however it has limited financial, technical and human resources to implement this task. Existing environmental quantity data are scarce due to a diminished hydro-meteorological monitoring network, lack of equipment and qualified staff. While there is a limited amount of current data on surface water quantity, such data do not exist for ground waters. Water budgets are not calculated for any river basins. The river basin modelling capacities are also limited within the NEA. These capacity weaknesses hinder sustainable allocation of water resources to different sectors and users.

The current water accounting system is also lax. Water users report their monthly water abstractions on an annual basis. In fact, there is no system on site to assure the quality of data, since environmental inspectors do not check water use records. Moreover, not all the water users submit their water use data to the MENRP and there is no system in place to enforce submissions of these reports. The quality and the completeness of reports vary significantly among water users, given the poor knowledge on how to fill in the data and what parameters to report on. The reports are submitted to the MENRP as hard copies and then these data are submitted to the water accounting database by the Ministry staff. Only one person from the MENRP is in charge of data entry and given a significant volume of data, therefore human error is not a rare phenomenon. Furthermore, precise geographic coordinates of water intakes are not indicated which makes it impossible to create georeferenced databases for water usage. New law on water will require water users installing hydrological measurement and metering equipment at intake areas. Moreover, since the water abstractions will be subject to water use permits, environmental inspectors will have a right and greater mandate to check adherence with permit conditions.

Regarding the sectors having significant impacts on natural resources, they are not managed in a sustainable way. More specifically, in the area of agriculture, during irrigation water abstractions environmental flows are not taken into consideration, since irrigation water use is not subject to environment impact permitting. As a result, issues of irrigation water efficiency are paid little or no attention by system owners/operators. Most of the existing irrigation-drainage systems are not gravitation-based and require pumping. Losses in the systems are high. The current fee for irrigation water use (75 GEL/hectare) does not guarantee proper operations and maintenance of the systems, as well as their development. Furthermore, there are no economic mechanisms for introduction of state-of-the art technologies (e.g. drip irrigation systems). The current institutional setting for the irrigation-drainage sector is also very poor. The existing state-owned company cannot ensure proper operations and maintenance of the systems as well as collection of fees from farmers. Hence, the privatization of these systems can improve the management. However, given the poverty level in Georgia and the ability of local farmers to pay water use fees, it might be still very difficult to have a high percentage rate for collection of fees from farmers. All these issues will be addressed by the “Georgian Irrigation and Land Market Development Project” through developing a National Irrigation Strategy.

As for the potable water supply sector, although the situation has significantly improved in recent years in terms of access to safe drinking water, many towns and the majority of rural settlements still lack centralized water supply systems and/or a reliable water supply. Absence of water abstraction charges as well as low water consumption tariffs and absence/lack of metering do not provide an incentive for water use efficiency.

4 GENERAL FINDINGS AND RECOMMENDATIONS FOR BASIN WATER ALLOCATION PLANNING IN GEORGIA

4.1 GENERAL FINDINGS

The analysis of the existing enabling environment for basin water allocation planning in Georgia has showed that there is no enabling environment for applying modern basin allocation approaches. Barriers for proper allocation planning includes the following: Absence of regulations, tools (regulatory or market-based) and knowledge for efficient, fair and environmentally sustainable basin allocations as well as low government capacities for water quantity data collection and analysis, calculating water balances and compiling water cadasters'. Environmental considerations in water use allocations are also neglected due to the absence of methodological and legal basis as well as knowledge on Environmental Flow Assessments. It is worth mentioning that the ongoing legal reform in the water resources management sector will address many challenges if the new law on Water Resource Management is enacted and effectively implemented. However, even with a new law there are some drawbacks in terms of supporting basin allocation planning.

4.2 RECOMMENDATIONS

Based on analysis of existing legal-regulatory, policy and the institutional setting as well as existing barriers to basin water allocation planning, the following recommendations can be drawn up for Georgia:

Legal-Regulatory Framework:

- The new Law on Water Resource Management should be enacted;
- Detailed guidelines/methodologies for river basin planning, including water allocation planning should be developed and adopted as sub-law/regulation to the given law;
- Regulations on establishing river basin management districts should be adopted;
- Regulations on establishing river basin consultative councils should be adopted;
- Regulations should be developed on carrying out water use inventories and cadasters. Moreover, clear responsibilities of designated authorities to perform these tasks should be defined;
- Regulations on water quantity monitoring in line with EU WFD should be enacted and implemented;
- Unified methodologies for calculating water budgets should be developed and adopted;
- The Law on Environmental Impact Permits should be amended to include activities that might have significant environmental impacts (e.g. construction or significant modification of large-size water supply and irrigation systems);
- The Law on Environmental Impact Permits and law on Licenses and Permits should be amended to expand the list of the use of natural resources subject to licensing (e.g. use of surface water resources);
- Water abstraction regulations should be revised to set-up more clear and precise terms and conditions for abstractions;
- Methodology for defining Water abstraction/use charges should be developed;
- Water abstraction charges should be introduced;
- A nation-wide methodology for calculation of environmental flow requirements of rivers should be adopted.

Institutional Framework, Capacity Building:

- At the national level, an inter-agency state water commission composed of representatives of various line Ministries and other relevant organizations should be established to develop/coordinate the development of integrated water resources management 15-year strategy;
- River basin management district authorities should be established and strengthened;
- Water use resource inventories, water quantity monitoring, and compiling cadasters need to be improved, namely: (Statistical accounting should be conducted electronically so that water users be able to fill in electronic forms and submit them electronically; Geo-referenced data (geographic coordinates of water users) should be required to be submitted to the MENRP in order to link water use attribute data to Geographic Informational Systems (GIS); Water users should be obliged to

measure their abstractions and submit such data to the MENRP; Periodic trainings of water users should be carried out on statistical accounting system; A handbook/guidebook for industrial facilities should be developed and disseminated among targeted audience; Technical regulation should be developed and adopted on international standard-based methodology for calculation of amounts of water consumption, based on input and output data and other technological parameters; Training of industrial facilities, at least the large facilities should be conducted on a new methodology; Data verification and validation system should be introduced; Capacities of the NEA for hydro-meteorological and surface water quality and quantity monitoring, water inventories, creating water databases and cadasters should be developed at institutional and individual levels; Capacities for ground water monitoring should be developed at institutional in individual levels; Capacities of the NEA for calculating water balances, including available water resources pool and allocable water should be developed; Capacities of the NEA as well as various stakeholders for Environmental Flows Assessments should be developed), and; Linkage between hydro-meteorological, water and related resource use databases should be established;

- Institutional and staff-level capacities of the environmental inspectorate should be developed to effectively carry out compliance assurance monitoring and control for environmental impact and water use permit conditions.

Water Resources Policy and Planning:

- A National Integrated Water Resources Strategy/Plan should be developed through inter-Ministerial efforts to include an assessment of available and allocable water resource pools and ideally, water allocation/abstraction shares for six river basin districts (Kura, Alazani-Iori, Khrami-Debed, Rioni-Enguri, Kodori-Bziphi, Chorokhi-Adjaristskali). In addition, in an ideal case the plan should consist of environmental flows for major river basins, being a part of river basin management districts (Kura, Alazani, Iori, Khrami, Rioni, Enguri, Kodori, Adjaristskali, Chorokhi);
- The entire country of Georgia should be divided into river basin management districts, as prescribed by the new Law on Water Resources Management;
- Integrated river basin management plans, including water allocation plans should be developed for river basins of high importance;
- Economic valuation of ecosystem goods and services for major ecosystems of Georgia should be carried out.

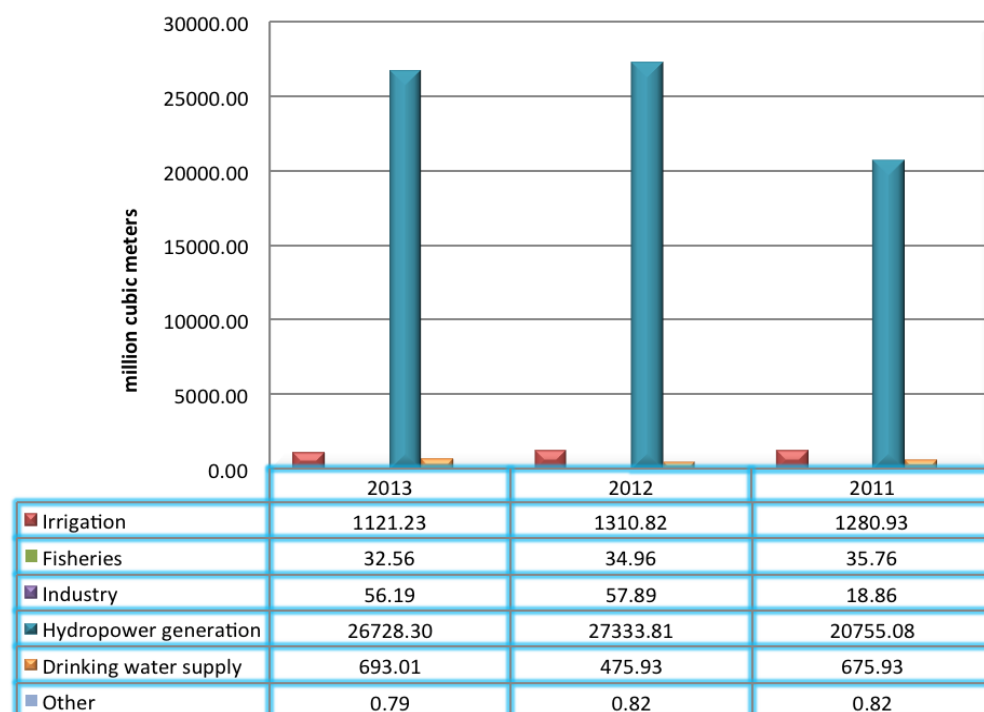
Water Use Sectors:

- A land reclamation policy/strategy should be developed;
- Institutional reform in the irrigation-drainage sector should be further implemented to make the sector efficient and effective;
- Incentives for irrigation water use efficiency and introduction of state-of-the art technologies should be developed and adopted;
- Environmental flow requirements should be set and enforced for irrigation water uses;
- Individual water metering systems should be installed;
- Losses in the drinking water network should be reduced/minimized through replacement or repair of the networks;
- Proper water tariffs taking into consideration affordability of Georgian population should be set to ensure cost-recovery and reasonable profit. Step/block tariffs can also be applied to take into consideration social factors, e.g. interests of the poorest people;
- Legal basis favorable for renewable energies, including small hydropower and other alternative sources of energies should be developed and adopted either as a part of existing law on Electricity and Natural Gas or as a separate law/sub law;
- Proper policies should be adopted for promotion of utilization of local renewable energy sources (e.g. feed-in tariffs, tax relief, guaranteed purchase of electricity, etc.).

ANNEX 1: END USERS²⁰

Currently, the single largest water use sector in Georgia is hydropower in terms of water abstraction and consumption, followed by irrigation, potable water supply, fisheries and industry sectors. More specifically, in 2013 total of 28,632.08 million m³ water was abstracted, of which only 403.15 million m³ (~1.41%) was taken from groundwater and the rest – from surface waters. Hydropower sector abstracted 26,728.30 million m³ (93.4%), irrigation sector – 1,121.23 m³ (3.9%), potable water supply sector - 693.01 million m³ (2.4%), industry sector - 56.19 million m³ (0.2%) and others – 0.79 million m³ (0.1%).

Figure 15. 2011-2013 Water Abstractions by Various Sectors, Million Cubic Meters



More or less similar trend was with water consumption, except for irrigation sector, which consumed less than abstracted and transferred unused water to hydropower sector. Namely, total of 2,7436.75 million m³ water was consumed (the difference between abstracted and consumed amounts is the system loss), of which consumption for hydropower generation was 26,508.3 million m³ (96.62%), for drinking water supply - 448.19 million m³ (1.63%), for industrial production - 362.54 million m³ (1.18%) and for irrigation - 155.64 million m³ (0.57%). Both water abstraction and consumption have increased in 2012 and 2013 compared to 2011 figures by 26%-30% on average.

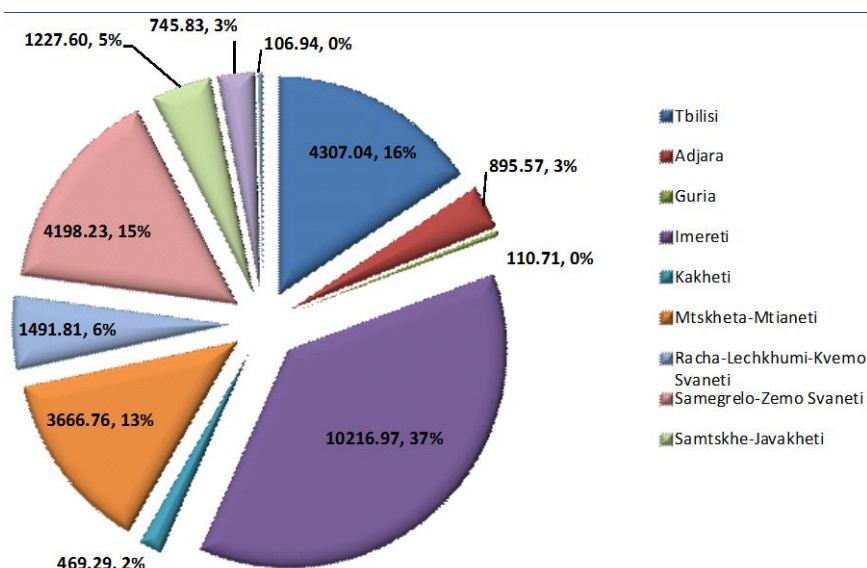
Table 12. 2011-2013 Water Consumption for Various Purposes

Year	Drinking	Industry	Irrigation	HPPs	Fisheries
2011	439.15	357.92	114.91	20557.9	126.04
2012	330.15	362.54	338.26	27422.43	114.38
2013	448.19	324.62	155.64	26508.3	0

As for the regional distribution of water uses, the largest water consumer was Imereti region (Rioni basin), followed by Tbilisi (Kura Basin, Aragvi sub-basin), Samegrelo-Zemo Svaneti (Enguri and Rioni Basins) and Mtskheta-Mtianeti (Kura river basin). Below is given a pie chart of contributions of various regions to total 2013 consumptions.

²⁰ Source: Ministry of Environment and Natural Resources Protection. Currently, data on water uses are available until 2014, since 2014 data are currently being processed by the MENRP

Figure 16. 2013 Water Consumption by Various Regions, Million Cubic Meters



Tables 15-16 below include official data of the MENRP on water abstractions above 500 000 m³/year by individual water users for the basins of Caspian and Black Seas.

Table 15. 2013 Water Abstractions above 500,000 m³/year by Individual Water Users in the Caspian Sea Basin

Rivers	Water users (with water abstraction more than 500,000 m ³ /year)	Abstracted water , thousand m ³ /year	Rivers	Water users (with water abstraction more than 500,000 m ³ /year)
	Name of organization	Activity		Name of organization
Tergi	LTD UWSCG, Stepantsminda service center			17010
	LTD Georgian sugar	Sugar Production	553	
Kura	LTD Kaspo cement	Cement Production		615.294
	I.E. "Vladimer Chkhaidze"	Fish Pond		630.7
	LTD UWSCG, Dedoplistskaro service center	Water Supply	682.56	
	LTD UWSCG, Akhmeta service center	Water Supply	756.8	
	LTD UWSCG, Telavi service center	Water Supply	826.1	
	LTD UWSCG, Lagodekhi service center	Water Supply		830.4
	LTD UWSCG, Lagodekhi service center	Water Supply		832.8
	LTD UWSCG, Telavi service center	Water Supply	1043.6	
	I.E. "Raphael Khachaturian"	Fishery Pond		1244.4
	LTD UWSCG, Gori service center	Water Supply	1276.86	
	LTD UWSCG, Gori service center	Water Supply	1468.05	
	LTD UWSCG, Gori service center	Water Supply	1468.05	
	LTD UWSCG, Tianei service center	Water Supply	1581	
	LTD UWSCG, Dedoplistskaro	Water Supply	1712.4	

Rivers	Water users (with water abstraction more than 500,000 m ³ /year)	Abstracted water , thousand m ³ /year	Rivers	Water users (with water abstraction more than 500,000 m ³ /year)
	Name of organization	Activity		Name of organization
	service center			
	LTD UWSCG, Gurjaani service center	Water Supply	1971	
	LTD UWSCG, Sagarejo service center	Water Supply		2558.64
	LTD UWSCG, Telavi service center	Water Supply	3335.5	
	LTD UWSCG, Gori service center	Water Supply	3638.23	
	LTD UWSCG, Tianeti service center	Water Supply	4020	
	LTD UWSCG, Tianeti service center	Water Supply		5440.2
	LTD "Energy"	HPP		90201.6
	LTD "Mtkvari"	HPP		323070.4
	LTD United Amelioration systems of Georgia - Tashiskari-saltvisi service center	Irrigation		9677
	LTD United Amelioration systems of Georgia -Mtkvari-Jandari service center	Irrigation		119277
	LTD Rustavi hpp	HPP		521000
Alazani	LTD "Kotekhi"	Vine Production	500	
	LTD Alcoholic drinks	Vine Production	500	
	LTD Teliani veli	Vine Production	530	
	LTD Tbori	Fish Pond		706
	I.E. Liana Turmanidze	Fish Pond		799.4
	LTD Knarelis Marani	Vine Production	1300	
	LTD Telavi Vine	Vine Production	3650	
	LTD Georgian vines and drinks	Vine Production	72403	
	LTD United Amelioration systems of Georgia - Kvemo Alazani service center	Irrigation		482348
	LTD Mailingroup	Auto Washing		526
Iori	LTD United Amelioration systems of Georgia -Kvemo samgori service center	Irrigation		175800
Iori/Tbilisi Reservoir	LTD GWP	Water Supply		116951
	LTD GWP	Water Supply		121339
Iori/Sioni reservoir	LTD United Amelioration systems of Georgia -Zemo samgori service center	Irrigation/HPP		225269
Kabali	LTD Kabali HPP	HPP		36640
Bursa	LTD Knindzmarauli corporation	HPP		25500
Intsoba	LTD Prime Energy	HPP		2001
Khrami	LTD Rustavi Metallurgical factory	26.70	649.6	
	LTD Ktsia	HPP		60427.15
	LTD United Amelioration systems of Georgia -Khrami-Debeda basin service center	Irrigation		27522.3
Debeda	LTD United Amelioration systems of Georgia -Khrami-Debeda basin service center	Irrigation		16068
Mashavera	LTD United Amelioration systems of Georgia -Mashavera	Irrigation		67041

Rivers	Water users (with water abstraction more than 500,000 m ³ /year)	Abstracted water , thousand m ³ /year	Rivers	Water users (with water abstraction more than 500,000 m ³ /year)
	Name of organization	Activity		Name of organization
	basin service center			
Naziklich	LTD United Amelioration systems of Georgia - Mashavera basin service center	Irrigation		15522
Algeti reservoir	LTD United Amelioration systems of Georgia -Algeti-Tbilisi-Kumisi basin service center	Irrigation		19390
Aragvi	LTD GWP	Water Supply	10613	
	LTD GWP	Water Supply	27959	
	LTD GWP	Water Supply	52338	
	LTD GWP	Water Supply	56730	
	LTD GWP	Water Supply	68436	
	LTD GWP	Water Supply	72918	
	LTD United Amelioration systems of Georgia -Saguramo-mukhrani basin service center	Irrigation		67884
Aragvi/Jinvali Reserour	LTD Georgian Water	HPP		1249694
Ksani	LTD United Amelioration systems of Georgia -Saguramo-Mukhrani basin service center	Irrigation		723
	LTD United Amelioration systems of Georgia -Tezi-Okami-Does-Grakali service center	Irrigation		6971.3
Tezami	LTD United Amelioration systems of Georgia -Tezi-Okami-Does-Grakali service center	Irrigation		4443
Narekvavi	LTD United Amelioration systems of Georgia -Saguramo-Mukhrani basin service center	Irrigation		1740
Didi Liakhvi	LTD United Amelioration systems of Georgia -Tashiskari service center	Irrigation		6100
	LTD United Amelioration systems of Georgia -Tashiskari service center	Irrigation		4100
Patara Liakhvi	LTD United Amelioration systems of Georgia -Tiriphoni service center	Irrigation		4020
Suramula	LTD Georgian shugar	Sugar Production		3317.446
Paravani	I.E. Badri Melikidze	Fishery Pond		600

Table 16. 2013 Water Abstractions above 500,000 m³/year by Individual Water Users in the Black Sea Basin

Rivers	Water users (with water abstraction more than 500 000 m ³ /year)	Abstracted Water, thousand m ³ /year	Rivers	Water users (with water abstraction more than 500 000 m ³ /year)
	Name of organization	Activity		Name of organization
Enguri	Enguri HPP	HPP		4185289
Lajanuri Reservoir / r.Tskhenitskali and r. Lajanuri	JSC Energo pro Georgia – Lajanurhesi	HPP		859351
Kintrishi	Rural water supply Kobuleti municipality	Drinking Water Supply		662
	LTD Ajara Water - water supply systems of t.Kobuleti	Drinking Water Supply	6368.42	
Kinkisha	LTD Zahesi -Kinkisha HPP	HPP		12128
Ackva	LTD Kobroni	Fishery Ponds		640
Atchitskali	LTD Mtsirenergia " Atchi hpp"	HPP		32032.3
Rioni	LTD UWSCG, Kutaisi service senter	Drinking Water Supply	824.833	
	LTD UWSCG, Kutaisi service senter	Drinking Water Supply	6195.45	
	LTD UWSCG, Kutaisi service senter	Drinking Water Supply	10397.855	
	Energo Pro Georgia- Rioni HPP	HPP		1905000
	LTD GumatiHPP2	HPP		3541000
	LTD GumatiHPP1	HPP		1426300
	LTD Vartsikhe HPP 2005	HPP		6457000
Tkibuli Reservoir	LTD EnergoPro Georgia – Fzevrulhesi	HPP		1999185
Ritseula	LTD Ritseulhesi	HPP		32317
Bzhuzha	LTD International Energy Corporation - Bzhuzahesi	HPP		87122
Abasha	LTD UWSCG, Photi service senter	Drinking Water Supply		11370
	LTD Abhesi HPP	HPP		149372.7
Gubistskali	LTD UWSCG, Tskaltubo service senter	Drinking Water Supply	1976.7	
Kvirila	LTD UWSCG, Chiatura service senter	Drinking Water Supply	646	
	LTD UWSCG, Chiatura service senter	Drinking Water Supply	714	
	LTD Georgianmanganez	Steel and Cast Iron Production	915.85	
	LTD UWSCG, Chiatura service senter	Drinking Water Supply	1190.3	
	LTD Georgianmanganez	Steel and Cast Iron Production		7947.3
Shaori Reservoir	LTD UWSCG, Tkibuli service senter	Drinking Water Supply		3099
	LTD EnergoPro Georgia – Shaorhesi	HPP		
Korolistkskali	LTD Batumi water supply	Drinking Water Supply		6035.4
Chakvistkskali	LTD Oraguli 2008	Fishery Ponds		620
	I.E. Malkhaz Dvalishvili	Fishery Ponds		625.6
	LTD Batumi water supply	Drinking Water Supply		29619.5
Chorokhi	I.E. Akhmed Diasamidze	Fishery Ponds		590
	LTD Batumi water supply	Drinking Water Supply	4677.2	
Charnali	I.E. Ismael Barunjadze	Fishery Ponds		550
Acharitskali	I.E. Nodar Saginadze	Fishery Ponds		518

Rivers	Water users (with water abstraction more than 500 000 m ³ /year)	Abstracted Water, thousand m ³ /year	Rivers	Water users (with water abstraction more than 500 000 m ³ /year)
	Name of organization	Activity		Name of organization
	I.E. Giorgi Nakashidze	Fishery Ponds		580
	I.E. Suliko Kobuladze	Fishery Ponds		650.3
	I.E. Nadim Devadze	Fishery Ponds		850
	I.E. Ilia Gogotidze	Fishery Ponds		1080
	I.E. Merab Jabinidze	Fishery Ponds		1150
	LTD Atshesi HPP	HPP		801251
Machakhela	LTD Machakhela HPP	HPP		132557
Akavreta	LTD Akavreta 2007	Fishery Ponds		5585
	I.E. Zauri Makharadze	Fishery Ponds		856.8
Chirujhistskali	LTD Sanalia HPP	HPP		27528
Khobitskali	LTD UWSCG, Tsalejikha service senter	Drinking Water Supply	570.83	
	LTD Zahesi - Chkhorotskuhesi	HPP		223210
Chanitskali	LTD UWSCG, Khobi service senter	Drinking Water Supply	1752.9	
	LTD Skurhesi	HPP		30000

It is noteworthy to mention that about 30 HPP investment projects are under implementation, with all of them to be put into operation by 2020, adding on to the water use demand by the hydropower sector (Please see annex for existing and potential HPP sites). More HPP projects are also planned, however they require investment. Moreover, irrigation water use will also increase by 2020 due to rehabilitation of existing irrigation systems and adding 30,000 hectares under improved irrigation.

In general, we can assume that all major consumptive water uses will grow by at least 2%, following the trend of Gross Domestic Product (GDP) annual growth rate that will increase the pressure on water resources and aquatic ecosystems (unless water conservation and efficiency measures as well as environmental flows requirements are implemented). Future forecasts (by 2050 and by 2100) for climate change impacts on river flow and water demand for some rivers (e. g. the rivers Iori, Alazani and Rioni conducted under United Nations Development Programme (UNDP)/ Global Environmental Facility (GEF) Second National Communications and USAID Global Water for Sustainability Program (GLOWS) and Integrated Natural Resources Management in Watersheds of Georgian Program (INRMW) projects) do not indicate a significant decline in river run-off and thus, on water shortage. However, for the River Iori some water deficit may occur for crops.

ANNEX 2: STATUS OF HPP'S

Table 1.HPPs, Existing and Under Construction²¹

#	Power Plants	Installed Capacity (MW)	Estimated Annual Generation (GWh)	Type	Commencement Data
Existing Hydro Power Plants		2,791.96	8,806.85		
Including The Regulatory		1,991.20	5,166.40		
1	Engurhesi	1,300.00	3,347.70	Seasonal Regulation	Existing
2	Vardnilihesi	220.00	613.00	Seasonal Regulation	Existing
3	Khrami-1	112.80	217.00	Seasonal Regulation	Existing
4	Khrami-2	110.00	328.00	Seasonal Regulation	Existing
5	Shaorhesi	38.40	116.90	Seasonal Regulation	Existing
6	Dzevrulhesi	80.00	147.50	Seasonal Regulation	Existing
7	Zhinvalhesi	130.00	396.30	Seasonal Regulation	Existing
Including The Seasonal		646.10	2,843.80		
8	Vartsikhehesi	184.00	829.00	Daily Regulation	Existing
9	Rionhesi	48.00	286.50	Daily Regulation	Existing
10	Gumathesi	66.80	276.90	Daily Regulation	Existing
11	Lajanurhesi	112.50	332.80	Daily Regulation	Existing
12	Atshesi	16.00	58.40	Run-of-River	Existing
13	Chitakhevihesi	21.00	102.70	Run-of-River	Existing
14	Zahesi	35.80	166.00	Daily Regulation	Existing
15	Ortachalahesi	18.00	82.80	Daily Regulation	Existing
16	Satskhenhesi	14.00	26.60	Run-of-River	Existing
17	Khadorhesi	24.00	120.00	Run-of-River	Existing
18	Larsihesi	19.00	111.00	Run-of-River	Existing
19	Faravanhesi	87.00	451.10	Run-of-River	Existing
Including The Deregulated		154.66	796.65		
20	Tetrikhevihesi	12.40	24.00	Run-of-River	Existing
21	Bzhuzhahesi	12.24	84.65	Run-of-River	Existing
22	Sionhesi	9.14	25.75	Run-of-River	Existing
23	Mashaverahesi	3.86	6.42	Run-of-River	Existing
24	Alazanhesi	4.80	41.50	Run-of-River	Existing
25	Abhesi	2.00	6.98	Run-of-River	Existing
26	Algetahesi	1.25	3.52	Run-of-River	Existing
27	Chalahesi	1.50	4.47	Run-of-River	Existing
28	Chkhorhesi	3.35	17.90	Run-of-River	Existing
29	Dashbashi	1.26	10.95	Run-of-River	Existing
30	Intsobahesi	1.65	6.30	Run-of-River	Existing
31	Kabalhesi	1.50	7.61	Run-of-River	Existing
32	Mashaverahesi	0.80	2.70	Run-of-River	Existing
33	Misaktsieli Ento	3.00	12.30	Run-of-River	Existing
34	Ritseulahesi	6.10	35.10	Run-of-River	Existing
35	Skurhesi	1.02	4.80	Run-of-River	Existing
36	Tiriponhesi	1.26	15.75	Run-of-River	Existing
37	Khertvisihesi	0.60	1.80	Run-of-River	Existing
38	Bakuri(Machakhela)	1.60	5.84	Run-of-River	Existing
39	Kazbegihesi 2	0.38	1.40	Run-of-River	Existing
40	Energetiki(Akhalk)	0.59	1.44	Run-of-River	Existing
41	Igoetihsesi	1.05	10.23	Run-of-River	Existing
42	Sanaliahesi	5.00	7.78	Run-of-River	Existing
43	Achihsesi	1.00	5.01	Run-of-River	Existing
44	Kinkishahesi	1.40	2.38	Run-of-River	Existing
45	Kakharetihsesi	2.00	15.20	Run-of-River	Existing
46	Sulorihsesi	0.80	2.93	Run-of-River	Existing

²¹ Source: Ministry of Energy of Georgia. <http://www.energy.gov.ge/documents%20mediacenter.php?lang=eng>

#	Power Plants	Installed Capacity (MW)	Estimated Annual Generation (GWh)	Type	Commencement Data
47	Okamihesi	1.60	8.20	Run-of-River	Existing
48	Zvaretihesi	0.26	0.93	Run-of-River	Existing
49	Rustavhesi	1.50	3.54	Run-of-River	Existing
50	Pshavelahesi	1.00	11.60	Run-of-River	Existing
51	Lopotahesi	2.50	8.13	Run-of-River	Existing
52	Pantianihesi	0.40	2.55	Run-of-River	Existing
53	Khadori 2	5.40	30.00	Run-of-River	Existing
54	Shildahesi	5.00	34.50	Run-of-River	Existing
55	Khanhesi	0.30	1.50	Run-of-River	Existing
56	Rachahesi	11.00	82.66	Run-of-River	Existing
57	Dagvahesi	0.10	0.49	Run-of-River	Existing
58	Alazani-2	6.00	41.75	Run-of-River	Existing
59	Bakhvihesi 3	10.00	38.63	Run-of-River	Existing
60	Aragvihesi	8.50	50.77	Run-of-River	Existing
61	Axmetahesi	9.10	54.86	Run-of-River	Existing
62	Kazretihesi	2.50	13.80	Run-of-River	Existing
63	Kazbegihesi	6.00	39.40	Run-of-River	Existing
64	Pshavelahesi (Store Power)	1.95	8.63	Run-of-River	Existing
Construction Stage					
1	Kirnati HPP	51.25	219.00	Daily Regulation	2017
2	Khelvachauri HPP 1	47.50	229.80	Daily Regulation	2017
3	Dariali HPP	108.00	521.00	Run-of-River	2016
4	Khobi HPP 2	41.80	187.00	Run-of-River (Cascade)	2017
5	Mtkvari HPP	48.00	232.00	Run-of-River	2018
6	Lukhuni HPP 2	12.00	74.00	Run-of-River	2018
7	Nabeglavi HPP	1.90	13.00	Run-of-River	2016
8	Kintrisha HPP	5.00	30.00	Run-of-River	2016
9	Skhalta HPP	6.00	27.10	Daily Regulation	2020
10	Shuakhevi HPP	175.00	437.00	Daily Regulation	2018
Total		496.45	1,969.90		
Permitting Stage					
1	Khobi HPP 1	46.50	221.00	Daily Regulation	2018
2	Koromkheti HPP	150.00	463.00	Daily Regulation	2020
3	Khertvisi HPP	65.00	239.00	Run-of-River	2021
4	Abuli HPP	22.20	116.20	Run-of-River	2015
5	Debeda HPP	2.50	13.00	Run-of-River	2016
6	Kasleti HPP 1	8.10	46.40	Run-of-River	2019
7	Kasleti HPP 2	8.10	45.80	Run-of-River	2019
8	Darchi HPP	16.90	93.60	Run-of-River	2021
9	Mestiachala HPP 2	27.00	115.00	Run-of-River	2020
10	Ubisa HPP	7.60	35.00	Run-of-River	2018
11	Akavreta HPP	19.00	82.00	Run-of-River	2021
12	Wind Power Plant Kartli	20.00	93.17		2017
13	Skurdidi HPP	1.42	9.30	Run-of-River	2017
14	Rachkha HPP	10.25	31.50	Run-of-River	2018
15	Saguramo HPP	4.20	36.35	Run-of-River	2017
16	Khudoni HPP	702.00	1,527.86	Seasonal Regulation	2022
17	Nenskra HPP	210.00	1,194.00	Seasonal Regulation	2021
18	Namakhvani Cascade	411.00	1,560.00	Seasonal Regulation	2021

Table 2. HPPs Under the Stage of Feasibility Studies²²

#	Feasibility Study Stage	Installed Capacity (MW)	Estimated Annual Generation (GWh)	Type	Commencement Data	Conceptual design	Pre-feasibility	Feasibility	Detailed design
HYDRO LARGE									
1	Cirmindi HPP	13.40	65.80	Run-of-River	2022			X	
2	Ghebi HPP	14.00	72.83	Daily Regulation	2022			X	
3	Tsablari HPP	14.62	63.20	Run-of-River	2018			X	
4	Chiora HPP	14.89	68.79	Run-of-River	2022			X	
5	Barisakho HPP	15.30	77.00	Daily Regulation	2022			X	
6	Larakvakva HPP	17.10	87.00	Run-of-River	2021			X	
7	Lechekha HPP	18.40	90.80	Decade Regulation	2022			X	
8	Machakhela HPP 2	19.00	115.00	Daily Regulation	2020			X	
9	Vedi HPP	19.40	96.80	Run-of-River	2022			X	
10	Metekhi HPP 2	21.17	116.00	Daily Regulation	2019			X	X
11	Machakhela HPP 1	23.00	127.00	Run-of-River (Cascade)	2020			X	
12	Metekhi HPP 1	23.80	131.00	Daily Regulation	2019				X
13	Ckhimra HPP	27.60	134.40	Daily Regulation	2022			X	
14	Erjia HPP	29.10	133.70	Daily Regulation	2022			X	
15	Dolra HPP 3	30.00	124.00	Run-of-River	2019			X	
16	Nobulevi HPP	42.00	197.40	Daily Regulation	2022			X	
17	Kheledula 3 HPP	60.44	255.04	Daily Regulation	2022			X	
18	Alpana HPP	70.30	356.80	Run-of-River	2021			X	
19	Sadmeli HPP	153.00	637.60	Run-of-River	2021			X	
20	Oni Cascade	177.20	788.64	Run-of-River	2021		X		
21	Tskhenistskali Cascade	347.00	1,744.00	Seasonal Regulation	2024		X		
Total Hydro Large		1,150.72	5,482.80						
HYDRO SMALL									
22	Chapala HPP	0.50	3.00	Run-of-River	2018			X	
23	Buja HPP 2	1.00	5.20	Run-of-River	2020			X	
24	Kheor HPP	1.00	6.67	Run-of-River	2018			X	X
25	Jonouli HPP 1	1.10	5.10	Run-of-River	2017			X	
26	Supsa Mtsire HPP	1.10	6.30	Run-of-River	2019			X	X
27	Khokhnistskali HPP 1	1.30	7.90	Run-of-River	2020			X	
28	Khokhnistskali HPP 2	1.30	7.50	Run-of-River	2020			X	
29	Didkhevi HPP	1.30	7.00	Run-of-River	2018			X	
30	Buja HPP 1	1.63	8.70	Run-of-River	2020			X	
31	Sioni HPP 1	1.70	7.80	Run-of-River	2019			X	
32	Sioni HPP 2	1.70	7.80	Run-of-River	2019			X	
33	Sioni HPP 3	1.70	7.80	Run-of-River	2019			X	
34	Buja HPP 3	2.32	12.30	Run-of-River	2020			X	
35	Artana HPP	2.50	13.50	Run-of-River	2020			X	
36	Khokhnistskali HPP 3	3.10	18.00	Run-of-River	2020			X	
37	Avani HPP	4.60	18.63	Run-of-River	2017			X	
38	Sashuala HPP 2	4.97	34.26	Run-of-River	2018			X	
39	Sashuala HPP 1	5.10	35.54	Run-of-River	2018			X	
40	Mleta HPP	5.45	36.20	Daily Regulation	2020			X	
41	Jonouli HPP 2	6.60	30.00	Run-of-River	2018			X	
42	Kvirila HPP	6.60	40.00	Run-of-River	2021			X	
43	Paldo HPP	6.80	48.90	Run-of-River	2020			X	

²² Source: Ministry of Energy of Georgia. <http://www.energy.gov.ge/documents%20mediacenter.php?lang=eng>

#	Feasibility Study Stage	Installed Capacity (MW)	Estimated Annual Generation (GWh)	Type	Commencement Data	Conceptual design	Pre-feasibility	Feasibility	Detailed design
44	Surebi HPP	6.90	40.80	Run-of-River	2019			X	
45	Okrili HPP	7.00	30.50	Run-of-River	2021			X	
46	Bukistsikhe HPP	7.40	40.70	Run-of-River	2019			X	
47	Supsa Mtsire HPP	7.40	44.00	Run-of-River	2019			X	
48	Vani HPP	7.60	44.50	Run-of-River	2019			X	
49	Udzilaurta HPP	7.72	38.28	Daily Regulation	2022			X	
50	Lopota HPP 1	8.00	46.00	Run-of-River	2020			X	
51	Ghere HPP	8.30	44.70	Run-of-River	2022			X	
52	Lakhami HPP	9.60	99.20	Run-of-River	2019			X	
53	Ckhvandiri HPP	9.80	44.10	Run-of-River	2021			X	
54	Zeda Bghugha HPP	9.80	41.00	Run-of-River	2019				X
55	Qvesheti HPP	10.05	67.40	Daily Regulation	2020			X	
56	Mazhieti HPP	12.25	56.40	Daily Regulation	2022			X	
57	Jonouli HPP 3	13.00	65.00	Run-of-River	2018			X	

Table 3. Potential HPPs Below 13 MW²³

#	Name	River	Region	Installed Capacity (MW)	Average Annual Generation (mln. kWh)	Regulation Type
1	Bakhvi HPP 4	Bakhvistskali	Guria	1.0	5.6	Run-of-river
2	Duruji HPP	Duruji	Kakheti	1.7	10.7	Run-of-river
3	Bakhvi HPP 5	Bakhvistskali	Guria	2.0	9.5	Run-of-river
4	Muskhvi HPP	Injasu	Samtskhe-Javakheti	2.0	8.0f	Run-of-river
5	Kobi HPP	Mnaisistskali	Mtskheta-Mtianeti	3.9	18.4	Run-of-river
6	Khani HPP 2	Laishura	Imereti	4.0	18.1	Run-of-river
7	Lebarde HPP 2	Tekhuri	Samegrelo-Zemo Svaneti	4.2	17.5	Run-of-river
8	Uraveli HPP 1	Uraveli	Samtskhe-Javakheti	4.3	16.5	Run-of-river
9	Zarzma HPP	Dzindzistskali	Samtskhe-Javakheti	4.3	19.8	Run-of-river
10	Medani HPP	Chanistskali	Samegrelo-Zemo Svaneti	4.4	23.9	Run-of-river
11	Lebarde HPP 1	Lebarde	Samegrelo-Zemo Svaneti	4.6	19.8	Run-of-river
12	Marelisi HPP	Bzholiskhevi	Imereti	4.6	19.7	Run-of-river
13	Samkuristskali HPP 1	Samkuristskali	Kakheti	4.9	25.7	Run-of-river
14	Uraveli HPP 2	Uraveli	Samtskhe-Javakheti	5.1	16.0	Run-of-river
15	Enguri HPP 1	Enguri, Shavtskala-Kvishara	Samegrelo-Zemo Svaneti	5.5	22.4	Run-of-river
16	Lesulukhe HPP	Tsachkhuri	Samegrelo-Zemo Svaneti	5.7	24.9	Run-of-river
17	Khani HPP 5	Khanistskali	Imereti	5.8	31.9	Run-of-river
18	Khani HPP 1	Khanistskali	Imereti	6.2	28.7	Run-of-river
19	Boriti HPP	Dumala	Imereti	6.4	33.8	Run-of-river
20	Khani HPP 7	Khanistskali	Imereti	6.4	48.1	Run-of-river
21	Khani HPP 3	Laishura	Imereti	6.8	31.2	Run-of-river
22	Cheshura HPP	Cheshura	Racha-Lechkhumi and Kvemo Svaneti	7.5	32.4	Run-of-river
23	Lukhuni HPP 2	Lukhuni	Racha-Lechkhumi and Kvemo-Svaneti	7.5	46.0	Run-of-river
24	Kvirala HPP	Kviralskali	Guria	8.0	34.7	Run-of-river
25	Truso HPP	Tergi	Mtskheta-Mtianeti	8.7	40.9	Run-of-river
26	Juta HPP	Juta	Mtskheta-Mtianeti	8.9	42.0	Run-of-river
27	Jria HPP	Kvirila	Imereti	9.2	53.1	Run-of-river

²³ Source: Ministry of Energy of Georgia. <http://www.energy.gov.ge/documents%20mediacenter.php?lang=eng>

#	Name	River	Region	Installed Capacity (MW)	Average Annual Generation (mln. kWh)	Regulation Type
28	Iori HPP	Iori	Mtskheta-Mtianeti	9.7	54.0	Reservoir
29	Zestafoni HPP 1	Kvirila	Imereti	10.0	41.2	Run-of-river
30	Khani HPP 4	Khanistskali	Imereti	10.1	55.3	Run-of-river
31	Atskuri HPP	Mtkvari	Samtskhe-Javakheti	10.4	55.5	Run-of-river
32	Dviri HPP	Mtkvari	Samtskhe-Javakheti	10.4	55.5	Run-of-river
33	Sakuneti HPP	Mtkvari	Samtskhe-Javakheti	10.4	55.5	Run-of-river
34	Lukhuni HPP 1	Lukhuni	Racha-Lechkhumi and Kvemo-Svaneti	10.8	66.1	Run-of-river
35	Khunevi HPP	Dzirula	Imereti	11.0	61.6	Reservoir
36	Stori HPP 2	Stori	Kakheti	11.4	50.5	Run-of-river
37	Stori HPP	Stori	Kakheti	11.8	56.8	Run-of-river
38	Zestafoni HPP 2	Kvirila	Imereti	11.9	48.7	Run-of-river
39	Enguri HPP 3	Enguri	Samegrelo-Zemo Svaneti	12.1	50.0	Run-of-river
40	Enguri HPP 4	Enguri	Samegrelo-Zemo Svaneti	12.7	54.1	Run-of-river
Total				286.2	1404.1	

Table 4. Potential HPP above 13 MW²⁴

#	Name	River	Region	Installed Capacity (MW)	Average Annual Generation (mln. kWh)	Regulation Type
1	Stori HPP 3	Stori	Kakheti	13.7	60.6	Run-of-river
2	Chkheri HPP	Chkheri	Mtskheta-Mtianeti	14.8	68.0	Run-of-river
3	Akhalkalaki HPP	Paravani	Samtskhe-Javakheti	15.0	85.0	Run-of-river
4	Bakhvi HPP 1	Bakhvistskali	Guria	15.0	85.0	Reservoir
5	Zestafoni HPP 3	Kvirila	Imereti	15.9	59.2	Run-of-river
6	Zestafoni HPP 4	Kvirila	Imereti	15.9	59.2	Run-of-river
7	Negebi HPP	Mtkvari	Qvemo Qartli	16.8	128.3	Run-of-river
8	Qareli HPP	Mtkvari	Shida Qartli	17.3	74.7	Run-of-river
9	Skra HPP	Mtkvari	Shida Qartli	17.3	75.8	Run-of-river
10	Digomi HPP	Mtkvari	Tbilisi	17.5	95.0	Run-of-river
11	Ponichala HPP 1	Mtkvari	Tbilisi	17.5	95.0	Run-of-river
12	Ponichala HPP 2	Mtkvari	Tbilisi	17.5	95.0	Run-of-river
13	Uplistsikhe HPP	Mtkvari	Shida Qartli	18.1	97.3	Run-of-river
14	Ponichala HPP 3	Mtkvari	Qvemo Qartli	18.6	138.6	Run-of-river
15	Ponichala HPP 4	Mtkvari	Qvemo Qartli	18.6	139.3	Run-of-river
16	Rustavi HPP	Mtkvari	Qvemo Qartli	18.6	141.7	Run-of-river
17	Kheledula HPP 1	Kheledula	Racha-Lechkhumi and Kvemo-Svaneti	18.8	94.3	Run-of-river
18	Tekhuri HPPs 1-6	Tekhuri	Samegrelo-Zemo Svaneti	19.0	112.0	Run-of-river
19	Urbnisi HPP	Mtkvari	Shida Qartli	19.0	83.1	Run-of-river
20	Bakhvi HPP 2	Bakhvistskali	Guria	20.0	110.0	Run-of-river
21	Lekarde HPP	Magana	Samegrelo-Zemo Svaneti	20.0	107.0	Run-of-river
22	Kheledula HPP 2	Kheledula	Racha-Lechkhumi and Kvemo-Svaneti	20.1	95.3	Run-of-river
23	Tskhenistskali HPP 1	Tskhenistskali	Racha-Lechkhumi and Kvemo Svaneti	20.4	95.3	Run-of-river
24	Magana HPP	Magana	Samegrelo-Zemo Svaneti	20.6	106.4	Run-of-river
25	Grakali HPP	Mtkvari	Shida Qartli	20.7	111.7	Run-of-river
26	Akhalsopeli HPP	Mtkvari	Shida Qartli	20.8	96.1	Run-of-river
27	Gomi HPP	Mtkvari	Shida Qartli	20.8	105.2	Run-of-river
28	Kaspi HPP	Mtkvari	Shida Qartli	20.8	108.6	Run-of-river
29	Osiauri HPP	Mtkvari	Shida Qartli	20.8	104.9	Run-of-river
30	Qvishkheti HPP	Mtkvari	Shida Qartli	20.8	104.5	Run-of-river
31	Enguri HPP 2	Enguri,	Samegrelo-Zemo Svaneti	21.2	90.3	Run-of-river

²⁴ Source: Ministry of Energy of Georgia. <http://www.energy.gov.ge/documents%20mediacenter.php?lang=eng>

#	Name	River	Region	Installed Capacity (MW)	Average Annual Generation (mln. kWh)	Regulation Type
		Khaldeschala				
32	Snostskali HPP	Tergi	Mtskheta-Mtianeti	22.2	114.4	Run-of-river
33	Samkuristskali HPP 2	Samkuristskali	Kakheti	22.6	117.4	Run-of-river
34	Mestiachala HPP 1	Mestiachala	Samegrelo-Zemo Svaneti	23.7	103.5	Run-of-river
35	Khashuri HPP	Mtkvari	Shida Qartli	25.3	104.5	Run-of-river
36	Zeskho HPP 1	Zeskho/Koruldashi	Racha-Lechkhumi and Kvemo Svaneti	25.3	119.0	Run-of-river
37	Tergi HPP	Tergi	Mtskheta-Mtianeti	26.3	136.6	Run-of-river
38	Khelvachauri HPP 2	Chorokhi	Achara	28.9	129.0	Run-of-river
39	Enguri HPP 5	Enguri	Samegrelo-Zemo Svaneti	29.2	124.9	Run-of-river
40	Enguri HPP 6	Enguri	Samegrelo-Zemo Svaneti	34.0	143.3	Run-of-river
41	Ksani HPP	Mtkvari	Shida Qartli	37.3	200.9	Run-of-river
42	Khumpreri HPP	Khumpreri	Samegrelo-Zemo Svaneti	37.4	153.3	Run-of-river
43	Zoti HPP	Khinistskali, Gubazeuli, Kvira	Guria	48.0	225.1	Reservoir
44	Pari HPP	Enguri	Samegrelo-Zemo Svaneti	230.0	780.0	Reservoir
45	Tobari HPP	Enguri	Samegrelo-Zemo Svaneti	250.0	810.0	Reservoir
46	Khaishi HPP	Enguri	Samegrelo-Zemo Svaneti	670.0	1470.0	Reservoir
Total				2082.1	7754.3	

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